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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

FOREST INSECT INVESTIGATIONS

RMO

# MEMORANDUM FOR ARROWHEAD LAKE COMPANY: REPORTING FOREST INSECT CONDITIONS IN THE CONIFEROUS FORESTS SURROUNDING LAKE ARROWHEAD DURING THE YEAR 1937.

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by
J. E. Patterson
Berkeley, California
December 11, 1937

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Forest Insect Laboratory
Berkeley, California
December 11, 1937

MEMORANDUM FOR ARROWHEAD LAKE COMPANY: REPORTING FOREST INSECT CONDITIONS IN THE CONIFEROUS FORESTS SURROUNDING LAKE ARROWHEAD DURING THE YEAR 1937.

APPROVED BY:

J. M. Miller
Senior Entomologist, in Charge

SUBMITTED BY:

J. E. Patterson
Associate Entomologist

MEMORANDUM FOR ARROWHEAD LAKE COMPANY:

Reporting Forest Insect Conditions in the Coniferous Forests Surrounding Lake Arrowhead During the Year 1937.

A survey of insect infestation conditions in the forests surrounding Lake Arrowhead in the San Bernardino National Forest, California, was made by J. E. Patterson and W. D. Thomas of the Bureau of Entomology and Plant Quarantine during the period November 1 to 4, 1937.

This lake, and environs, is one of the principal recreational and summer home regions of southern California. Of the main attractions is the wealth of forest cover composed of native shrubs and both deciduous and coniferous trees. Mature specimens of the latter abound in practically all parts of the region constituting the greatest natural asset on many summer home sites where investments in buildings, etc. totals many hundred thousand dollars. It is self-evident that protection of such trees is essential in insuring these huge investments.

Of the several hazards forest trees are subjected to, insects are outstanding as chief agents of destruction. In this region they are of as much importance as forest fires so their ravages should be guarded against in equal measure. Past infestations are known to have occurred and several have been recorded since early in the present century. Attempts to control these earlier infestations began in 1922 and have been continued at irregular intervals since that time. These control operations have been carried out as independent projects undertaken only when infestations had reached epidemic status, or appeared to be increasing toward that intensity. A summary of the separate control projects carried out in the region shows that a total of 8 such projects has been completed.

| | Period | Acres | Trees | Board feet | Cost | |
|---|---|---|---|---|---|---|
| 1922 | Spring | 8.000 | 64 | 77.030 | $534.00 | |
| 1925 | Spring | 4.000 | 180 | 151.940 | 923.73 | |
| 1926 | Spring | 6.000 | 205 | 143.500 | ? | 1 |
| 1927 | Spring | 4.000 | 109 | 59.700 | 432.00 | |
| 1928 | Spring | 4.000 | 18 | 12.550 | 243.00 | |
| 1933 | Summer | 3.500 | 36 | 28.940 | 235.00 | |
| 1934 | Spring | 2.000 | 20 | 16.540 | 82.00 | |
| 1937 | Winter | 2.000 | 60 | ? | ? | 2 |

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1 Control work done through cooperative arrangement. Cost figures not available.

2 Work carried out by Arrowhead Lake Company. Cost figures not available.

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In addition to these separate projects, sanitation work done by the Lake Arrowhead Company during the period, resulted in treating some additional infested trees almost every year.

The success of these projects in holding insect losses down to a relatively low point may be measured by the small number of insect-killed snags present on the area as compared with a far greater number on other untreated areas lying eastward. The cost of these projects has been well repaid by the protection secured in a forest highly susceptible to barkbeetle attack.

1937SURVEY:

The methods employed for securing insect loss data for the year 1936, and the amount and character of the 1937 infestation, consisted in traversing the entire region via the many roads intersecting it; by topographic viewing of visible sites; and by close examination of areas where past losses have been concentrated. In addition an area of 40 acres was intensively surveyed and past and present losses (insect killed trees) were marked and plotted. This check plot is located on the divide ridge north of Arrowhead Lake and includes an undisturbed stand of pine and fir timber. Other conditions on the plot, such as site, exposure, soil characteristics, and elevation, make it representative of the entire region. The purpose in establishing the plot is twofold: an annual survey of the plot, which is planned, will result in securing accurate data on the species of insects involved in the yearly infestations, and the composition of these infestations, and second; the trend of the annual insect losses may be checked and this information used in formulating plans for control before increasing losses become threatening or epidemic. Basic data on number of trees killed annually can be used as a quantitative measure in estimating the total yearly loss for the entire region.

The 1937 survey resulted in securing a complete picture of the losses for the years 1936 and 1937. These are not alarming. The present loss is the lowest of any which has occurred during the past 7 years. The eastern, southern, and western sections are practically free of infestations. The small amount that persists in other sections is located on the ridge at the west end of the lake and throughout the broken country north of the lake. It gradually increases in volume toward the desert fringe and it is in these marginal stands that its intensity is greatest. A quantitative analysis shows that the amount of recent and current infestation is 12 trees killed in 1936 and 5 trees in 1937 on the area of 500 acres west of the lake. On the area of 1000 acres north of the lake 70 trees were killed in 1936 and 25 in 1937. These comparative yearly losses show that the infestation of 1937 is substantially less than that of 1936. The decrease, approximately 60 percent, in the most recent loss is partially due to a general downward trend of the infestation which resulted from natural causes and was effective throughout the region, but is also in part due to control work carried out in this section last winter by the Arrowhead Lake Company. This control covered an area of about 2,000 acres where 60 infested trees were cut and treated. Examination of the treated trees shows that this control work

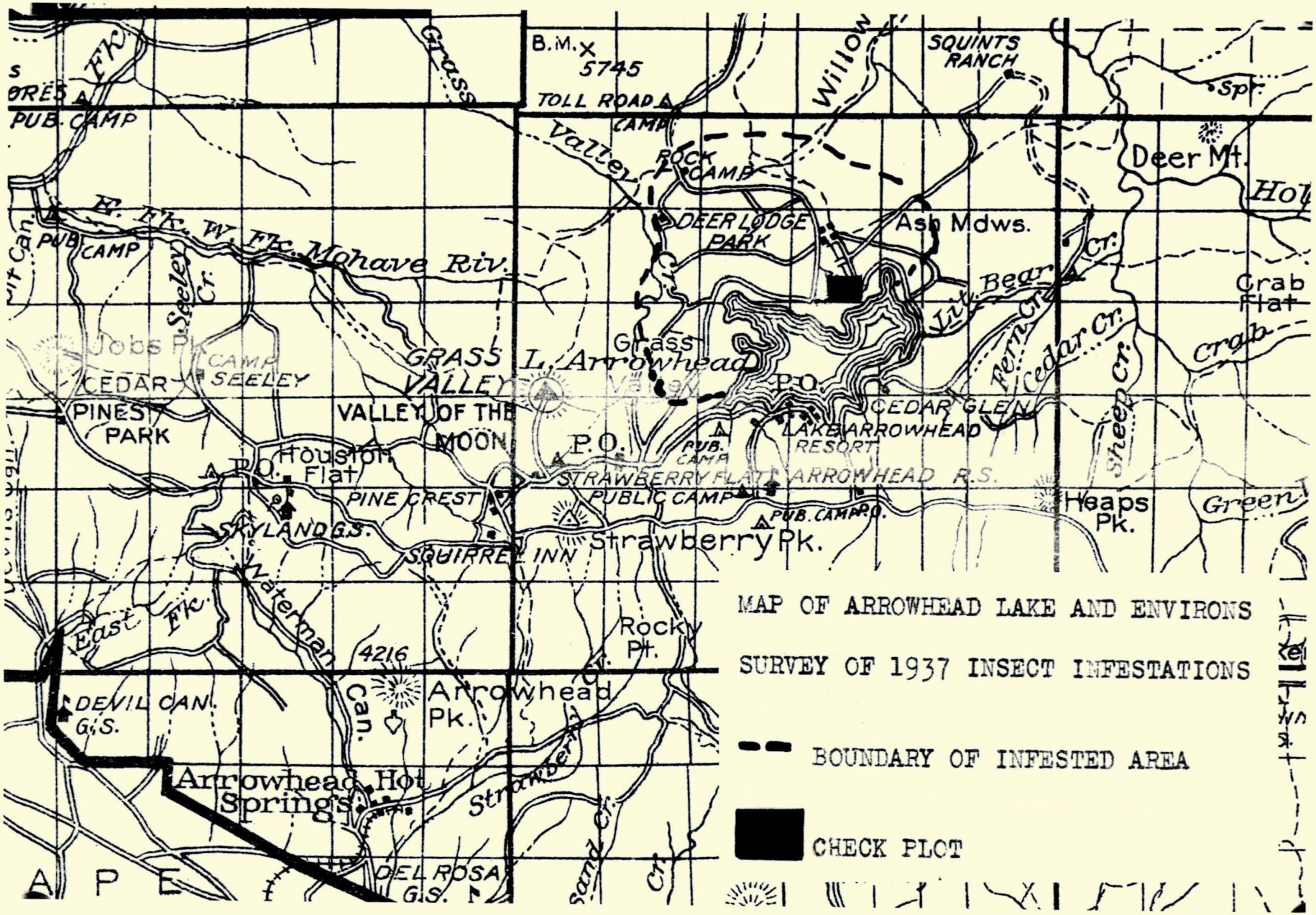
was carefully done and effective in accelerating the natural decrease. It is an example of the beneficial results to be secured by maintenance control work done before infestations materially increase.

The abundance of snow break which resulted from the heavy storms of last winter caused considerable concern during the early part of the season, since it was discovered at that time that engraver beetles and flathead borers were attacking it freely; most of the slash becoming fully infested. However, due to the very dry early summer, this slash soon seasoned and became too dry for development of the insect broods which resulted in their death. Examination of this material in November showed that practically no emergence had occurred and no standing trees had been attacked in the vicinity of the slash.

Since infestations in the region are now at a low point with consequent minimum amount of damage, it is not advisable to attempt more than a small amount of maintenance control during the coming winter and spring periods. However, all infested trees on intensively used sites, and on developed grounds, should be removed and treated as soon as they are detected. Such beetle broods should be completely destroyed before they emerge and menace other trees in the near vicinity. At present the only method of control recommended for this region is to peel the bark from the infested section of attacked trees and completely burn it.

J. E. Patterson
Associate Entomologist.

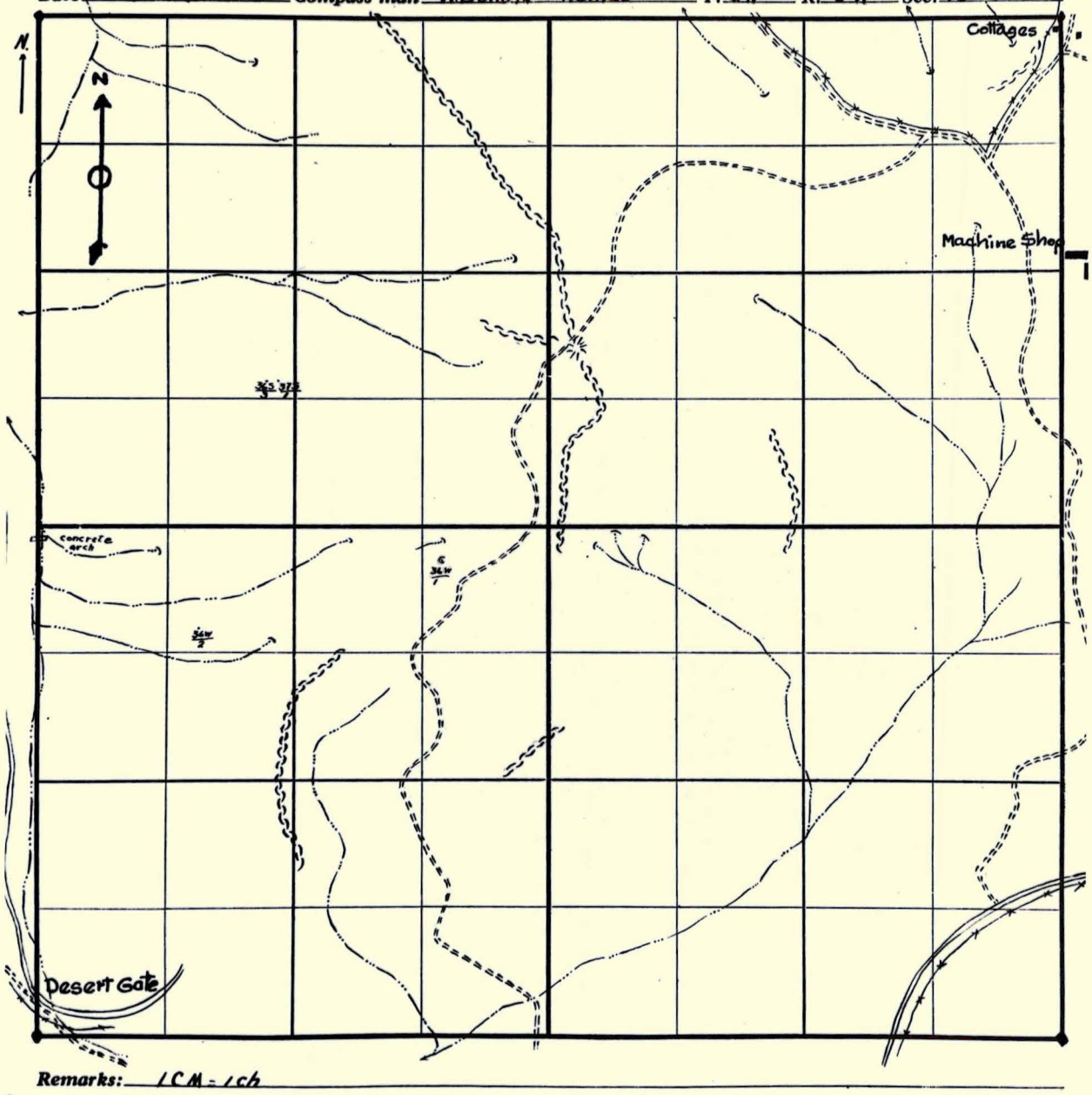
Berkeley, California
December 11, 1937.


MAP OF ARROWHEAD LAKE AND ENVIRONS
SURVEY OF 1937 INSECT INFESTATIONS
BOUNDARY OF INFESTED AREA
CHECK PLOT
A P E
B.M. X 5745
TOLL ROAD
SQUINTS RANCH
PUB. CAMP
ROCK CAMP
DEER LODGE PARK
Ash Mdws.
Deer Mt.
W. Fk. W. Fk. Mohave Riv.
Seeley Cr.
Jobs Pk.
CAMP SEELEY
CEDAR
PINES PARK
GRASS VALLEY
VALLEY OF THE MOON
Houston Flat
PINE CREST
SKYLAND G.S.
SQUIRREL INN
Grass L. Arrowhead Valley
P.O.
CEDAR GLEN
LAKE ARROWHEAD RESORT
STRAWBERRY FLAT PUBLIC CAMP
ARROWHEAD R.S.
Strawberry Pk.
Heaps Pk.
Rocky Pt.
Arrowhead Pk.
4216
East Fk.
Waterman
DEVIL CAN. G.S.
Arrowhead Hot Springs
DEL ROSA G.S.
Bear Cr.
Fern Cr.
Cedar Cr.
Sheep Cr.
Crab Flat
Green

# TREATING PLAT

Project Area Arrowhead Plot San Bernardino Unit 40 a Plot Camp No. Dec. 20°

Date Nov. 2 1937 Compass man W.Donald Thomas T. 2N R. 3W Sec. 10




Remarks: 1 CM = 1 ch

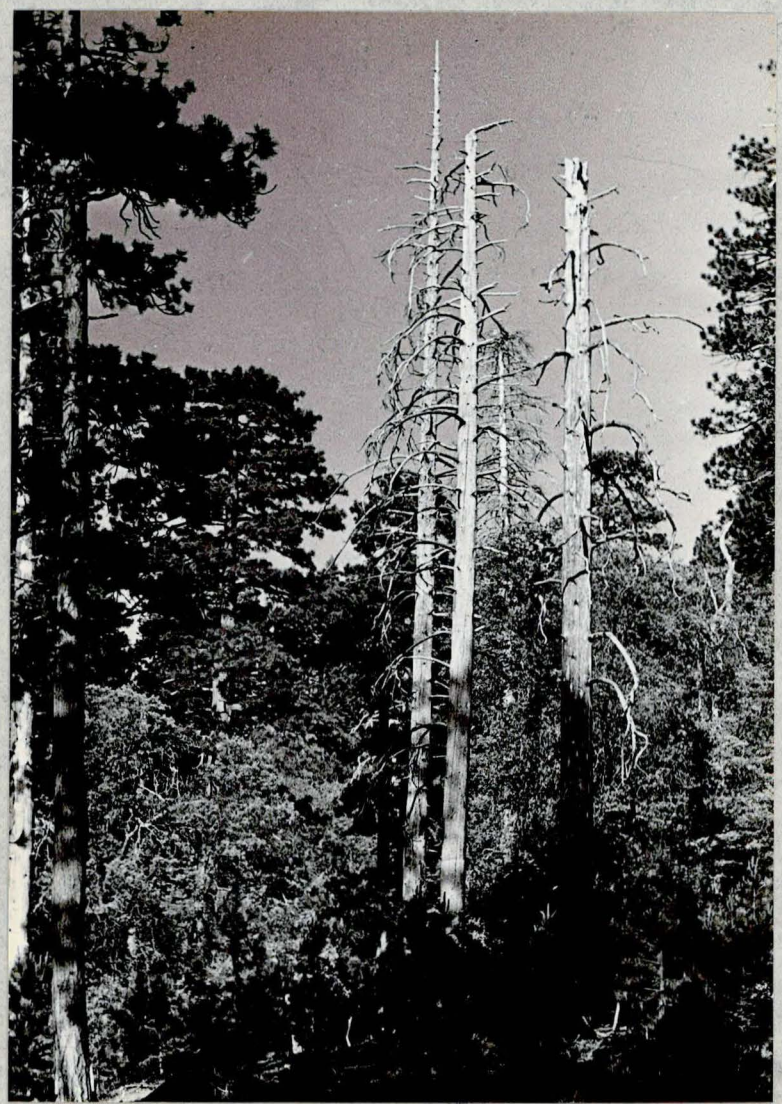
Map of Arrowhead Insect Survey Plot. Located in the south half of Sec. 10, Twp 2 N, R 3 W, San Bernardino Mer. Reference point is the SW corner located near the gate to the Desert Road. Showing topographic features and location of trees killed by insects in 1937.

USBE & PQ #10007

Topkilled trees on the grounds of one of the larger summer homes on the south shore of Arrowhead Lake. (Dead foliage shows white in photo) This preliminary topkilling often preceeds the attack on the lower trunk by the destructive pine barkbeetle (Dendroctonus brevicomis).

These trees were topkilled by the pine flathead during the summer of 1936. Two other pines on the same grounds were attacked and completely killed by the western pine beetle at the same time; these trees were promptly cut while still infested and the bark burned to destroy the beetles. This control work was properly timed and prevented the bark-beetles from emerging and attacking the lower trunks of the two top killed trees shown in the picture, which , except for the top injury, were still surviving in 1937.

This case is typical of an area where intensive surveys and control work are maintained. Sporadic centers of Barkbeetle infestation may at times develop due to the flight of the insects coming in from outlying marginal areas. However, if promptly taken in hand the damage can be greatly restricted.



USBE & PQ #10006

Upper Photo. One of the resorts in the Arrowhead Lake tract where the forest has been kept free from snags and serious loss of pine trees by intensive barkbeetle control work. Only a few topkilled trees are evident in this picture.

Lower Photo. An area in the Arrowhead Lake region (see page 2 of the text of this report) where barkbeetle control has been neglected. Accumulating snags are unsightly and create a serious fire hazard. It will require centuries of growth to replace the veteran trees which have been killed.

USBE & PQ #6279